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ABSTRACT

In the past, phonics instruction has done little to lessen the difficulties that many poor readers have with decoding words quickly and accurately enough to construct meaning from text. Based on an analysis of the research literature in decoding and a four-year cycle of program development, a new program was created for teaching decoding to poor readers of average or above average intelligence in grades 1 through 8. Approximately 275 Benchmark School students have received instruction using this program. The program guides students to become aware of patterns and consistencies in language and to apply a decoding process of using what they have learned about words to decode words they do not know. It is a teacher directed, supplemental program to be taught to a whole class for approximately 15 to 20 minutes a day and is intended to be used in conjunction with a basal reader or trade book program. The program features a multisensory approach, strong emphasis on vocabulary and language development, and a direct teaching model. Goals of the program include teaching students to use known words to decode unknown words, to discriminate structural components of words, to see how language is organized, to be flexible in pronouncing words, and to demonstrate automaticity in decoding--all as foundation blocks for the meaning-making process. Preliminary evidence suggests that the program has been successful in improving students' decoding skills. (Thirty-three references are attached.) (Author/ARH)

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CENTER FOR THE STUDY OF READING

A READING RESEARCH AND EDUCATION CENTER REPORT

Technical Report No. 424

A METACOGNITIVE APPROACH TO PHONICS: USING WHAT YOU KNOW TO DECODE WHAT YOU DON'T KNOW

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April 1988

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Abstract

For poor readers, one roadblock to the construction of meaning from text may be the inability to decode words quickly and accurately. In most cases more phonics instruction, similar to what has not worked in the past, does not improve this situation. Based on an analysis of the research literature in decoding and linguistics and a 4-year cycle of program development, a new program was created for teaching decoding to poor readers of average or above intelligence in grades 1 through 8. The program guides students to become aware of patterns and consistencies in our language and to apply a decoding process of using what they have learned about words to decode words they do not know. It is a teacher directed, supplemental program to be taught to a whole class for approximately 15 to 20 minutes a day and is intended to be used in conjunction with a basal reader or trade book program. The program features a multisensory approach, strong emphasis on vocabulary and language development, and a direct teaching model. Goals of the program include teaching students to use known words to decode unknown words, to discriminate structural components of words, to see how our language is organized, to be flexible in pronouncing words, and to demonstrate automaticity in decoding--all as foundation blocks for the meaning-making process. Preliminary evidence suggests that the program has been successful in improving students' decoding skills.

A METACOGNITIVE APPROACH TO PHONICS: USING WHAT YOU KNOW TO DECODE WHAT YOU DON'T KNOW

One of the characteristics that often distinguishes good readers from poor readers is automaticity in decoding words. While acquiring and applying decoding strategies appear to be painlessly easy for many children, the inability to break the code becomes a serious roadblock to fluent reading and good comprehension for others. This roadblock may become especially apparent in the intermediate grades where students encounter a steadily increasing amount of material in which the number and difficulty level of new words are not controlled and the content of the material is unfamiliar.

This paper describes a supplementary program that is being developed for elementary school-age poor readers, of average or above average intelligence, who demonstrate, as one roadblock to school success, a lack of automaticity in decoding words. In this pilot program, based on research in linguistics and decoding, teachers guide students to become aware of the patterns and consistencies in our language and to use what they are learning about words to decode words they do not know. Initially we called our program a compare/contrast program. However, those who have observed the program over the past 4 years have begun to refer to it as a metacognitive program because of the program's emphasis on awareness and control, the two components of metacognition (Baker & Brown, 1984).

Because poor readers often exhibit more than one roadblock to success in reading (Gaskins, 1984), the decoding program is only one part of a total curriculum designed to help students develop the strategies and behavioral characteristics associated with school success, as well as to build the cognitive and metacognitive foundation necessary for the construction of meaning. We have gathered data to ascertain whether participating in the decoding program, the newest addition to our curriculum, improved decoding ability for our students, and preliminary data suggest it does. We would encourage others to evaluate the usefulness of a metacognitive approach to decoding with other groups of poor readers. We are not claiming to have found one "best" method for teaching poor readers to decode, nor do we believe one exists, especially for students like ours who initially experienced difficulty in learning to read for a variety of reasons.

Our question is more metacognitive than methodological: If our poor readers are made more aware of how their language works and taught to use a systematic decoding strategy, will they exhibit decoding strategies that are more successful than those they used previously? The research reviewed in the next two sections suggests they should.

The Case for Decoding Instruction

The goal of reading instruction is to facilitate student independence in the construction of meaning. One of the foundation blocks for reaching this goal is automaticity in decoding words. The research suggests that good readers recognize the vast majority of words automatically and independently of context and use an automatic analogical decoding process when they encounter an unfamiliar word (Cunningham, 1975-76; Glushko, 1979; Perfetti, 1985; Stanovich, 1984). For skilled readers, acquiring a basic sight vocabulary and discovering how our language works appear to be cases of reciprocal causation (Stanovich, 1986). This is often not true, however, for poor readers. Some poor readers may have difficulty acquiring a sight vocabulary. Others, especially by the time they enter the intermediate grades, may possess a basic sight vocabulary without having developed concomitant orthographic knowledge (Zivian & Samuels, 1986).

Unlike skilled readers, poor readers often do not seem to *discover* clues about sound-symbol relationships; rather they depend on explicit instruction to learn how our language works (Barr & Dreeben, 1983; Calfee & Drum, 1986; Johnson & Bauman, 1984). Based on words previously learned, children who are good readers tend to generalize in a flexible manner their knowledge of vowel-consonant patterns and other structural components of words to new words in which these

parts are encountered (Fowler, Napps, & Feldman, 1985; Gibson & Levin, 1975; McClelland & Johnston, 1977; Torgesen, 1985; Vellutino & Scanlon, 1984). This approach to decoding is often referred to as an analogy or compare/contrast approach (Cunningham, Moore, Cunningham, & Moore, 1983). The compare/contrast approach requires phoneme awareness, segmenting skill, and prior word knowledge, skills that are present among most children in third grade who are progressing normally in reading (Zinna, Liberman, & Shankweiler, 1986).

It is not uncommon for teachers of poor readers to discover that, for some poor readers, breakdowns in the meaning-making process occur at the level of either phonological awareness or phonological processing (Bradley & Bryant, 1983; Perfetti, 1985; Stanovich, 1986). That is, poor readers may have minimal conscious awareness of the basic sound units (phonemes), as demonstrated by their inability to manipulate phonemes (i.e., supply rhyming words or match auditorily words that begin with the same sound), and/or difficulty associating a symbol or visual pattern with a sound or sound unit and with blending these parts to decode words. Thus, it appears that as a prerequisite to constructing meaning from text students not only need to acquire a sight vocabulary, but they need to develop phonological awareness and related skills, which culminate in the development of a flexible decoding process.

However, just as a large sight vocabulary does not guarantee comprehension, neither does knowledge of decoding strategies. Speed in applying these strategies is also just one of many factors related to success in constructing meaning. However, slow decoding can cause a breakdown in comprehension. If too much cognitive energy is spent on decoding, the reader is unable to focus on meaning. It is generally accepted that quick and accurate processing of each word increases the likelihood of good comprehension (Gough, 1983; LaBerge & Samuels, 1974; Perfetti, 1985). Therefore, students not only need to learn how to decode, but they also must become fast and accurate (automatic) in their application of this knowledge.

In summary, automaticity in decoding appears to be one foundation block for success in reading. Clearly, students may possess adequate orthographic knowledge, decode words automatically, and still not comprehend what they read. Thus, because automaticity in decoding is a necessary, but not sufficient, component of the meaning-making process, a decoding program can be considered only one part of a total program to improve the reading of poor readers. The development of one approach to the decoding component of a remedial program is described below.

Developing a Decoding Program

The decoding program described in this paper is the result of an analysis of the research literature and a 4-year cycle of program development, application in Benchmark School classrooms, evaluation, and refinement. The program was developed to meet the need of a population of poor readers to become automatic in decoding unknown words. Approximately 275 Benchmark students reading between the preprimer and sixth reader levels have received instruction using this program.

Prior to entering Benchmark School, an elementary school for poor readers of average or better intelligence, most of these students had received phonics instruction. In fact, many of them had received *intensive* rule-based and/or synthetic phonics instruction. Believing that more of what had not worked before was a poor solution to our students' decoding needs, we embarked on a literature search to identify axioms that would provide parameters for the development of the Benchmark School Word Identification/Vocabulary Development Program (BSWI/VDP). The axioms that undergird the program, as well as the student goals, are listed in Figure 1.

[Insert Figure 1 about here.]

A Metacognitive Approach to Decoding

At Benchmark School instruction in decoding is part of a daily supplementary lesson of 15 to 20 minutes that is an adjunct to a basal reader or trade book developmental reading program. The lessons are fast-paced and game-like, using a direct, explicit instruction model. Teachers tell students what they are going to teach them, why it is important, when it will be used, and how to do it. Next they model how to do it. This is followed by group guided practice with teacher feedback, then individual guided practice with teacher feedback. Emphasis is placed on a gradual release of responsibility from the teacher to the student, as well as on each student achieving a high degree of success. Student engagement and active involvement are fostered by the use of techniques such as every-pupil response, visual-auditory-kinesthetic response, and individual student checks.

The beginning level. Emphasis at the beginning level of the program is on developing phonological awareness and acquiring a basic sight vocabulary of 120 key words. As this level of the program assumes no prior knowledge in these areas, it is being used successfully with nonreaders. On the other hand, because of the fast pace and game-like quality of the lessons, it is proving equally appropriate for students who are reading at the beginning of the second level. Additional information regarding the decoding strategies used at the beginning level may be found in Cunningham et al. (1983), Mason and Au (1986), and Gaskins, Downer, and Gaskins (1986).

In Benchmark classrooms where the beginning lessons are being implemented, a visitor would see most or all of the following:

On Monday five new key words, written on five pieces of colored construction paper, are attached to the chalkboard by magnets. At the end of the week these five words will join other words placed in alphabetical order on the wall above the chalkboard. By the end of the school year 120 key words, containing both the major vowel spelling patterns (phonograms) and the common initial letter sounds found in our language, are displayed on the wall. (Selection of major phonograms was based on Fry, Fountoukidis, & Polk, 1985.) There will also be additional high-frequency irregular words and a few two- and three-chunk words displayed on white or red overlays attached to black construction paper to distinguish them from the key words containing major phonograms.

It is the first week of January and the words displayed on the chalkboard are *fish, five, splash, were,* and *school.* Also written on the chalkboard is "Please remind me about the cat." The teacher begins the lesson with a discussion of *why* they have daily decoding lessons, then asks the students what they have learned this school year about figuring out words they don't know. Answers include the following: "Read the whole sentence and say blank for the word you don't know." "Look for the spelling pattern and think of a key word that has the same spelling pattern." "Look for the vowel and what comes after it and find a word on the wall with the same pattern." Next the teacher models the use of the compare/contrast strategy using the sentence written on the chalkboard:

> Please blank me about the cat. Let's see, what would make sense in that sentence in place of blank that begins with *r*? Please run me about the cat, please rain me about the cat. None of those makes sense--guess I'll try the compare/contrast strategy. I need to look for the first vowel and what comes after it. Oh, oh--the first spelling pattern could be *e* or it could be *e-m*, I'll have to be flexible. I'll try *e* first because *he* is on the wall. The second vowel is *i* and the spelling pattern is *i-n-d*. I know the key word is find. If *h-e* is *he*, then *r-e* is *re*. If *f-i-n-d is find*, then *m-i-n-d is mind.* The word is *remind*. Let's see if it makes sense in the sentence. Please remind me about the cat. Yes, that makes sense. Remind means to help me to remember.

Next the five new words are introduced. The teacher or a student pronounces each, gives a sentence that shows an understanding of the meaning and use of the word, and tells what the spelling pattern is in the word. For the word *were* the teacher asks the students why they think she wrote it on white

paper attached to black paper. The students explain that *were* is irregular, thus the compare/contrast strategy won't prove useful; however, it is a common word in our language and is needed to construct many sentences. The students generate rhyming words for *fish* and *five*, and then write a structured language experience story that includes the five words. The story is composed by the class as a group story, written by the teacher on newsprint, and displayed throughout the week so it can be read and reread. Often it is also reproduced by the teacher and sent home for more reading.

Chant and Check Spelling follows. The teacher dictates the five key words displayed on the chalkboard (or, on other days of the week, any word on the word wall). Students write the words from memory if they can, but are free to copy them from the board, if needed, to spell the words correctly. After all five words are dictated and given in a sentence, the students Chant and Check their spelling of each word, pointing to each letter as the group chants.

The lesson concludes with the playing of What's In My Head. The teacher gives five clues and for each clue the students write a word from the wall. These clues are cumulative, though for the first clue it is often the case that any word on the wall would be correct. The clues for this day's lesson were (a) My word is on the chalkboard (or wall). (b) My word is a one beat word. (c) My word *rhymes* with a word that means "things you don't want anymore or that are not useful" (trash). (d) My word begins like *splendid*. (e) A baby likes to blank in the bath tub. Circulating around the room, the visitor notices that students have a variety of words written for numbers one and two, but that most students have confidently written *splash* for numbers three, four, and five. The teacher asks four or five students to read the words they have written for numbers one through five.

Tuesday's lesson goal is to introduce and reinforce the consonant blend */spl/* and review */sp/*. The lesson begins with a review of rhyming and key words:

> We have worked on rhyming a lot. Sometimes words rhyme when you hear them but do not have the same spelling pattern. (The teacher writes *bead* and *heed* on the chalkboard and pronounces them.) For the purposes of these lessons we are interested in rhyming words where the vowel and what comes after it are exactly the same. (The teacher writes *car/far* and pronounces the words.) Let's look at the word *wall*. I am going to ask each of you to choose a word on the wall, pronounce it, and tell us another word that has the same spelling pattern.

Each student has a turn and the teacher coaches the students to maintain a fast pace.

On the chalkboard is the sentence: "The falling object gained *momentum* as it fell." In a manner similar to that of the previous day, the teacher models the decoding of momentum using key words *go, ten,* and *drum*. Next, the students are given an every-pupil-response form that contains five sentences containing blanks. Below these sentences is a word bank with the five key words introduced the previous day. After reviewing the pronunciation of the words, the sentences are read to the students and the students write in the correct word from the word bank.

Tongue twisters come next, a part of the weekly cycle that students obviously enjoy. On a sentence strip attached with magnets to the chalkboard is: "Splotchy Splasher split and spliced splendid splinters." The teacher reads the tongue twister, students choral read it with her, and individual students volunteer to read it. This is followed by an every-pupil-response-card activity. Index cards are passed out to students on which they are instructed to write *splash*. They are also instructed to take out their "spider" card from a previous lesson. One at a time the teacher pronounces a list of */sp/* and */spl/* words (i.e., *spinster, splotch, splendiferous, specimen*, etc.), followed by her saying "ready, set, show." When the teacher says "show," the students hold up either the splah or spider card to indicate a word with the same beginning sound. Spelling Chant and Check and What's In My Head conclude the lessons.

Wednesday's goal is to reinforce spelling patterns and use known words to decode unknown words. The teacher begins by reviewing. "Who can remember the special endings we have worked on?" Students volunteer that they have learned that *s* added to words means more than one and that *-ing* and *-ed* have also been previously discussed. The sentence on the chalkboard is: "The mother *berated* the child." The teacher models decoding using key words *he* and *skate*. The meaning of the sentence is also discussed.

A spelling pattern every-pupil-response form is passed out to each child. At the top are three columns each headed by a key word (*right, ship, swim*). Below the key words is a word bank of 12 words each containing one of the three spelling patterns represented by the key words (i.e., *flight, prim, nip*). The word sort activity, which is part of every Wednesday lesson, is reviewed and the students begin to place the word-bank words in the columns with the same spelling patterns as the key words. Once completed, these words are read by the students. On the bottom half of the page are sentences containing some additional words that fit the spelling patterns featured in this lesson. Students are instructed to write below the underlined words the key words that would help decode each underlined word. The teacher circulates among the students reading sentences for each one and saying "blank" for the underlined word. For example, "The plants are dying with the blank" is read to the student. The student, after having written *right* below the underlined word blight says, "If this is right, then this is *blight*." Spelling Chant and Check and What's In My Head complete the 20-minute lesson.

Thursday's and Friday's lessons are similar, with systematic reinforcement of the featured key words for the week plus review of previously introduced key words and word beginnings and their application to the decoding of unknown words. Stress is always placed on *why* these lessons are being taught and on how to make real-world applications of the compare/contrast strategy.

The intermediate level. The intermediate level of the program was designed for intermediate-grade poor readers with a basic sight vocabulary that allows them to read independently at the mid-second-grade level or higher and who possess rudimentary, though sometimes spotty, phonological awareness. Emphasis at the intermediate level is on automatizing the use of the compare/contrast strategy, as well as on further discoveries about how our language is organized. It is at this level that teachers and students become fully cognizant of the admonition, "All that phonics can be expected to do is help children get approximate pronunciations" (Anderson, Hiebert, Scott, & Wilkinson, 1985, p. 41). Because most of the words presented at this level are polysyllabic, each may contain chunks with the schwa sound rather than the exact vowel sound of a key word. For this reason, a set for diversity is essential and "be flexible" becomes the motto for success in applying the compare/contrast strategy.

During the review phase of the intermediate level emphasis is placed on developing automaticity with respect to recall and use of the 120 key words as they are applied to phonetically regular, polysyllabic words. The second phase of the intermediate level, the moving-on phase, features a variety of formats and challenges. Additional key words are introduced, word meanings are explored, and the structure of words in our language is examined, emphasizing its morphophonemic and lexical nature. Individual differences with respect to decoding ability are met by providing words of two to six syllables for each class activity. As at the beginning level, all lessons at the intermediate level are teacher directed and feature a fastpaced, game-like format with daily feedback given to each student as he or she applies the compare/contrast strategy to words in meaningful context.

Students enjoy the variety and challenge found at the intermediate level. For example, during the week in February when students learned the new key words *leg, pull*, and *gull*, not only did they gain increased awareness of the need to be flexible (due to the two possible sounds of *ul*), but students decoded words that provided opportunities for the teacher to review or introduce instances of consistency in our language. A few of the hundreds of words decoded that week, each in a context that revealed its meaning, were *acculturation* (to review that *-sion* and *-tion* usually are "shun"); *trundle* (to review *le = el*); *ultimate* (to review the unaccented middle chunk with schwa); *impulsive* (to

introduce an etymology lesson on *puls* = drive, push, or throw and decode and discuss the meaning of *pulse, pulsation, repulse, compulsory, propulsion*, etc.); social (to discover that *ci* = *sh*, plus add the endings: *-ability, -able, -ly, -ism, -ist, and -istic* to the root word *social*); and *hallucinogenic* (to apply the discovery that *c* and *g* each have two sounds). The 2-minute check, a timed daily activity designed to encourage students to access key words as quickly as possible, and Challenge, a weekly contest among students, keep the focus on developing automaticity in decoding big words.

Preliminary Evaluation of the Program

Evidence gathered to date suggests that the BSWI/VDP is achieving its goals. Two tests of decoding competence have been individually administered to Benchmark students each spring since 1985. One test contains regular pseudo-words--nonwords that are pronounceable and close to English words. the other test contains "transfer words"--that is, English words that are not included in the BSWI/VDP. After factoring out age, IQ, sex, and ratings by previous teachers of number and severity of emotional blocks to learning, we found that Benchmark students showed a statistically significant increase on the transfer word test between the spring of 1985 and the spring of 1986. Scores on both tests are strongly related to the number of weeks students have received decoding instruction, and year to year gains on the two tests are related to the number of minutes per week of instruction. (Data for the spring of 1987, the fourth year of the pilot program, are currently being analyzed and will be available in a separate report from the Center for the Study of Reading, University of Illinois.)

Moreover, students in the classes of Benchmark teachers who were rated as adhering most closely to the program achieved substantially higher scores on both word identification tests. In addition, our evaluation suggests that students make the most progress in word identification when their teachers maintain a brisk pace and encourage application of the compare/contrast strategy during other teacher-led reading activities and during independent reading.

There were nonsignificant increases at Benchmark School between 1985 and 1986 on the Wide Range Achievement Test, Reading (Jastak & Wilkinson, 1984), the Metropolitan Achievement Tests, Reading Survey Test (Prescott, Balow, Hogan, & Farr, 1978), Achievement Tests, Word Knowledge (Durost, Bixler, Wrightstone, Prescott, & Balow, 1970), after discounting age, IQ, sex, and emotional blocks. Students of teachers rated during the school year as adhering most closely to the program as designed did better on these three tests, significantly better in the case of the Word Knowledge Test. Year-to-year gains on these three tests were related to progress on the two-word identification tests.

The picture that emerges from statistical analysis of test scores is that the amount and quality of instruction a student receives regarding how our language works and how to implement a compare/contrast strategy is strongly related to progress in word identification, which in turn is moderately related to general growth as a reader. Informal evaluation is consistent with this picture. Teachers and other professionals who have seen several cohorts of children at Benchmark agree unanimously that word identification competence has improved greatly since the introduction of the Word Identification/Vocabulary Development Program.

Questions for Future Research

Though our findings are preliminary, they raise interesting questions for further investigation: (a) do children reach a point in this decoding program where further instruction yields minimal or no gains in decoding ability? How do we measure when they reach this point? (b) As students become more automatic in decoding ability are they able to demonstrate significant gains in comprehension? (c) Is there a relationship between a teacher's understanding of the content of the BSWI/VDP (or of how our language works) and student progress in decoding ability, as suggested by the recent emphasis on teacher cognition (Shulman, 1986), as well as by our own preliminary data? (d) Do students in this decoding program demonstrate, at some later date, awarenesses and skills not taken into consideration in our present evaluation, such as improved spelling or acquisition of word meaning?

Summary

Poor readers often do not comprehend what they read because the words in the text are neither in their sight vocabulary nor automatically decodable. The 4-year program of research and development reported in this paper suggests that one successful approach to this problem may be to supplement the poor readers' basal reader or trade book program with a decoding program based on analogy or comparison/contrast that emphasizes awareness of how our language works and is taught by a teacher who has developed this awareness and shares it with students.

References

Anderson, R. C., Hiebert, E. H., Scott, J. A., & Wilkinson, I. A. G. (1985). *Becoming a nation of readers: The report of the commission on reading.* Washington, DC: U.S. Department of Education.

Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In P. D. Pearson (Ed.), *Handbook of reading research* (pp. 453-494). New York: Longman.

Barr, R., & Dreeben, R. (1983). *How schools work.* Chicago: University of Chicago Press.

Bradley, L., & Bryant, P. E. (1983). Categorizing sounds and learning to read--A causal connection. *Nature, 301*, 419-421.

Calfee, R., & Drum, P. (1986). Research on teaching reading. In M. W. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 804-849). New York: Macmillan.

Cunningham, P. M. (1975-76). Investigating a synthesized theory of mediated word identification. *Reading Research Quarterly, 11*, 127-143.

Cunningham, P. M., Moore, S. A., Cunningham, J. W., & Moore, D. W. (1983). *Reading in elementary classrooms.* New York: Longman.

Durost, W. N., Boxler, H. H., Wrightstone, J. W., Prescott, G. A., & Balow, I. H. (1970). *Metropolitan achievement tests, word knowledge.* New York: Harcourt, Brace, Javanovich.

Fowler, C., Napps, S., & Feldman, L. (1985). Relations among regular and irregular morphologically related words in the lexicon as revealed by repetition priming. *Memory and Cognition, 13*, 241-255.

Fry, E. B., Foutoukidis, D. L., & Polk, J. K. (1985). *The new reading teacher's book of lists.* Englewood Cliffs, NJ: Prentice-Hall.

Gskins, I. W. (1984). There's more to a reading problem than poor reading. *Journal of Learning Disabilities, 17*, 467-471.

Gaskins, I. W., Downer, M. A., & Gaskins, R. W. (1986). *Introdution to the Benchmark School word identification/vocabulary development program.* Media, PA: Benchmark Press.

Gibson, E. J., & Levin, H. (1975). *The psychology of reading.* Cambridge, MA: MIT Press.

Gletiman, L. R. (1985). Orthographic resources affect reading acquisition--If they are used. *Remedial and Special Education, 6*, 24-36.

Glushko, R. J. (1979). The organization and activation of orthographic knowledge in reading aloud. *Journal of Experimental Psychology: Human Perception and Performance, 5*, 674-691.

Gough, P. B. (1983). *Context, form, and interaction.* In K. Rayner (Ed.), eye movements in reading (pp. 203-211). New York: Academic Press.

Jastak, S., & Wilkinson, G. S. (1984). *The wide range achievement test--Revised.* Wilmington, DE: Jastak Associates.

Johnson, D. D., & Baumann, J. F. (1984). Word identification. In P. D. Pearson (Ed.), *Handbook of reading research* (pp. 583-608). New York: Longman.

LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reding. *Cognitive Psychology 6*, 293-323.

Marsh, G., Densberg, P., & Cooper, J. (1977). Developmental changes in reading strategies. *Journal of Reading Behavior, 9*, 391-394.

Mason, J. M., & Au, K. H. (1986). *Reading instruction for today*. Glenview, IL: Scott, Foresman.

McClelland, J. L., & Johnston, J. C. (1977). The role of familiar units in the perception of words and nonwords. *Perception and Psychophysics, 22*, 249-261.

Perfetti, C. A. (1985). *Reading ability*. New York: Oxford University Press.

Perfetti, C. A. (1986). Continuities in reading acquisition, reading skill, and reading disability. *Remedial and Special Education, 7*, 11-21.

Prescott, G. A., Balow, I. H., Hogan, T. P., & Farr, R. C. (1978). *Metropolitan achievement tests, reading survey test*. New York: Harcourt, Brace, Jovanovich.

Shulman, L. S. (1986). Paradigms and research programs in the study of teaching: A contemporary perspective. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 3-36). New York: Macmillan.

Stanovich, K. E. (1984). The interactive-compensatory model of reading: A confluence of developmental, experimental, and educational psychology. *Remedial and Special Education, 5*, 11-19.

Stanovich, K. E. (1986). Matthew effect in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*, 360-406.

Torgesen, J. K. (1985). Memory processes in reading disabled children. *Journal of Learning Disabilities, 18*, 350-357.

Vellutino, F. R., & Scanlon, D. M. (1984). Converging perspectives in the study of the reading process: Reactions to the papers presented by Morrison, Siegel and Ryan, and Stanovich. *Remedial and Special Education, 5*, 39-44.

Wolff, D. E., Densberg, P., & Marsh, G. (1985). Analogy strategies for improving word recognition in competent and learning disabled readers. *The Reading Teacher, 38*, 412-416.

Zinna, D. R., Liberman, I. Y., & Shankweiler, D. (1986). Children's sensitivity to factors influencing vowel reading. *Reading Research Quarterly, 21*, 465-480.

Zivian, M. T., & Samuels, M. T. (1986). Performance on a word-likeness task by normal readers and reading-disabled children. *Reading Research Quarterly, 21*, 150-160.